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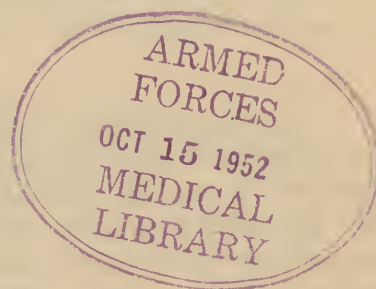
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AVIATION PHYSIOLOGISTS BULLETIN

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AVIATION PHYSIOLOGISTS AND THE PERSONAL EQUIPMENT OFFICERS' PROGRAM

I

Five Aviation Physiologists have been sent to each recent class of the Personal Equipment Officers' Course at AAF School of Applied Tactics. Some of these men have come from as far away as Arizona, California or Nebraska. The expenditure of time and money to send these physiologists to Orlando is considerable. The question pertinently arises, therefore, "What is gained by this? In what way will the Altitude Training Program be benefited?"

The physiologists who came were patient. They sat through talks on the effects of high altitude on the body; they went through an altitude chamber indoctrination; they heard the intricacies of the A-12 regulator and the virtues of a well-fitted oxygen mask discussed, and so on, through much of the two weeks that the course lasts. Of what value is the Personal Equipment Officers' Course for men who have taught these things, day in and day out, for months? The answer to this is not simply stated. In general, however, it may be said truthfully that two objectives are accomplished. How these may be translated into effective Air Forces training is still debatable since it depends upon local situations, on the one hand, and individual ingenuity, on the other. The two-fold gains are first, that new material is presented which physiologists either have not had or have had only piece-meal, and second, the real nature of the work, organization, and administrative duties of Personal Equipment Officers are presented. The unique facilities at AAFTAC make the first objective possible, and the presence now on the staff of men who have been part of an effective Personal Equipment Unit in the USAAF in the UK or who have personally made a study of it, guarantee the second.

II

TRAINING PERSONAL EQUIPMENT OFFICERS' AT AAFSAT. The present course for Personal Equipment Officers incorporates new methods of training in several respects compared to the earlier courses. In the first place, there is teaching of small groups (less than twenty) in all applicatory and field work, while lectures and conferences are reserved for large groups. In the course for Personal Equipment Officers offered in England by the Central Medical Establishment, USTAF, all classes are limited to twenty officers. This is one reason for the high degree of effectiveness of that training. At AAFTAC, small groups are possible by using a daily rotation schedule and with equal benefit. In this way, the advantage of a small group is realized although there are eighty or more students in a class.

At the beginning of the course, orienting didactic work covering a variety of subjects is given. This is necessary because practical and field work, using the equipment concerned, follows at once. Thus, considerations of altitude, of oxygen systems, and chamber indoctrination, and flying clothing, are followed soon after by a high altitude flight in heavy bombardment aircraft lasting about four hours during which oxygen and flying clothing are used. Later comes a two hour

indoctrination in the refrigerated chamber. Similarly, throughout the entire first week, the elements of ditching, ditching drill, dinghy drill, types of life rafts, life raft maintenance, air/sea rescue communications, sea search procedures, emergency rations and observations of an air/sea rescue diorama of a ditching and sea search are taken up from time to time. Then, as an effective summarizing demonstration in its real proportions, a sea search by AAFTAC and US Navy units is staged off the eastern coast of Florida. One half of the class puts dinghies with men in them in a predetermined area covering some 110 square miles of ocean. The other half of the class witnesses a briefing of the crews of three bomber search craft. They then go as observers on an actual sea search in quest of the two dinghies. This search is considered successful only when the naval crash boats are directed on a good fix to the dinghies. When the day is over, every participating Personal Equipment Officer has an appreciation of the part he can play in making any successful sea search possible. This is the only place in the United States at this time, where a complete view of air/sea search and rescue is taught. Another important feature of the course at AAFTAC is emphasis upon a definition of the organization a Personal Equipment Officer must establish if he is to be effective. Lectures on this subject range from a vivid account by Captain Dohrman, formerly a Personal Equipment Officer in the Eighth Air Force, of the way Personal Equipment Officers go about their work to a description of the building and facilities that are required, of Group and Wing (air division) standard operating procedures, of methods of training replacement and combat aircrews by Personal Equipment Officers to the administrative work and an account of the enlisted help a Personal Equipment Officer requires. In order to implement this didactic training, visits are made to demonstration Personal Equipment Units for fighter and bomber groups respectively operating in conjunction with nearby AAFTAC flying units. This aspect of the training will be new to most Aviation Physiologists. It is by far the most important development in the Personal Equipment Officers' Training. It brings life to the program and assures genuine appreciation of the means of effecting AAF Reg 55-7. Its aim is to give point to the teaching about the care and inspection of equipment. In short, the emphasis is less on mechanics, gadgets and technic, and more on the organizational means of making effective inspections, and use of personal and protective equipment under varied operational conditions.

The reason for stressing this aspect of the training rests upon a sound basis. An effective Personal Equipment Officer is one who runs a service organization like a business, and not a technician's paradise. Officers like Captain W. N. McGough, AC, Captain H. J. Dohrman, AC and Captain S. G. McGavic who were outstanding group or air division Personal Equipment Officers in the Eighth Air Force brought back this viewpoint with emphasis. Their own experiences gave proof of it. In a tour of duty throughout the United Kingdom in part of last November, December, and January, I saw proof of it also. It fell to my lot to make a special survey of the of the situation at every echelon in the Eighth and Ninth Air Forces, from line to headquarters. Examples were numerous but telling of a few of them may prove of

interest, and serve a useful purpose.

III

TRAINING PERSONAL EQUIPMENT OFFICERS IN THE U.K. The heart of the program for Personal Equipment Officers in the U. K. is the Central Medical Establishment under the command of Colonel Harry Armstrong, M. C. The course is under the Physiology Section supervised by Lt. Colonel J. J. Smith, M. C. Most of the instruction is carried out by Flight Surgeon Captain R. J. Trockman, M. C., and Aviation Physiologist Captain F. P. Chinard, M. C. The classes for Personal Equipment Officers are streamlined for the job they have to do. There are three types, one for Personal Equipment Officers from heavy bomb groups, one for officers from fighter groups, and one for "others", such as troop carriers, medium bombers, transport, etc. The first is a full ten days to two week course, the others last for five days. The difference between them underscores the fact that the responsibilities and work in the first kind of an organization are at least twice as great as in any of the others. In our course at AAFTAC we have men who may be transferred or re-assigned to different types of units overseas, therefore, all who come must receive a general orientation type of course.

The emphasis in training both abroad and here is to get across to the Personal Equipment Officer what he can and cannot do; what he must and must not do, with whom he must coordinate his work, and so forth. Most definitely, the Personal Equipment Officer is not to be taught to be a gadgeteer, or a mechanic. With respect to equipment, proper use and operation are about all that is required in this respect. Trips made into the field bore out this impression which I gained by observing the course being taught at Pinetree. One example of these activities will show what I mean.

IV

On 10 January 1944, I boarded a train at Liverpool Station, London, and went on a train trip lasting about two hours to _____, a base of one of the oldest heavy US bomb groups operating in the United Kingdom. So well concealed was the exact location of this base that both orders and train ticket carried me to a station or two beyond the actual station stop for this base. When I arrived at the base, and after signing in, I went to the Officers Mess for lunch and inquired for Lt Charles C. Carveth, Group Personal Equipment Officer. It was immediately clear from the response to my inquiries that Lt Carveth was well known, well liked, and a generally appreciated individual on the base. This was equally true with respect to the staff officers and a group of officers and men who drifted into the headquarters building.

After lunch, I found Lt Carveth in an office in a hut down along the line. In conference with him at the time was the Third Air Division, Personal Equipment Officer, Major W. J. Mendelhall, and two of the four squadron Personal Equipment Officers who work with the group Personal Equipment Officers. As I sat back, listening to what went on, the range of problems being dealt with brought to me an immediate

appreciation of the true work of the Personal Equipment Unit. In quick succession the problems came up; some of the F-2 suits had proved of little value in keeping hands and feet warm,--Why? How should the new room across the hall be fixed up for a class room, with benches, blackboards and mock-ups? Were the new swivels on the B-17G ball turrets working out all right? The supply of rubber bands for fixing parachute shrouds was low - how could a shortage be prevented or dealt with? Be sure to attend to requisitions for Class 13 items to make up shortages lost when combat crew men failed to return. These are a few of the points that come to my mind four months later, when I think back to the hour and a half I waited before Lt Carveth could take time to show me his organization and facilities. This he soon did.

In the electricians shop we found a "dissected" F-2 suit, and a large, complete wiring diagram of it drawn in detail. The energy output of each circuit had been worked out. Here was proof that the gloves and shoes of this particular suit yielded only a fraction of the expected or required heat output. The question concerning it resulted from interrogation after a combat mission. In this respect the Personal Equipment Officer followed the malfunction to an ultimate conclusion. The solution? Through Headquarters of Air Division went still more pressure for more and better electrically heated suits at the earliest possible moment, in the meantime rush F-1 suits.

Next, we went to the parachute department. This is, normally, in the Engineering Section, but here at Base _____ it was found wise to turn the management of the whole unit over to the Group Personal Equipment Officers in operations. What was gained by this? Well, the work of the parachute department is three-sided. Packing, repair, and rigging is one. This was handled by some seven or eight men for the group. Inspection, daily after every mission and every ten days, along with adjustments of harnesses is a second function. For this, eight parachute men, two per squadron were assigned to the locker and drying room, to be described below. The third function is operation of the sewing room. Here, repairs to chutes are made and helmets and other articles of clothes are modified. It was here that I saw a "ball turret zoot suit". This was a fancy modification of a winter shearling lined flying suit made for a large ball turret gunner. It was somewhat like a swallow tail suit but with arms cut out, and the tails so made that they snapped around the thighs. The excess layers in the groin, abdomen, and under the knees had been removed in order to eliminate bunching. This, it seemed to me, was a true carrying out of the spirit of the AAF Reg. 55-7 yet it is not mentioned there in black and white. From here we went to the dinghy building. This was a large building with a very big table for folding, mending, modifying, and packing dinghies. Stores of one-man seat type dinghies for immediate issue were there. These are given out when other are brought in for inspection and repacking twice monthly. Emergency Mk-4 packs, special modifications combining RAF kits and American items lined one side of the building, ready for installation on to the planes. Five-man dinghies and B-4 Life Vests in ample reserve completed the equipment in this unit.

From here, we went to one of two buildings that were just alike. These

housed the locker and drying rooms. These rooms are much more than just that. Each squadron has separate facilities for every man. In these he may keep boots, oxygen mask, Mae West, seat type dinghy and other special flying clothing. To the rear is the drying room, the heart of the Personal Equipment Officers work in the U.K. Here, electrically heated suits are taken in, cleaned, tested, hung on drying racks by combat crews, and parachutes (snap-on types only) are taken in, inspected, cleaned, replaced if necessary, or if ready for instant use, put in bins. These hold only two each, ready for re-issue. It is here that required adjustments in harnesses are made by the parachute men. In the front of this building are two important rooms and several offices. Interrogations are carried out here, and there are intelligence boards and facilities. In a wide center hall are tables where, on returning from a raid, the crews, officers and men alike, find tables weighed down with doughnuts, cheese, sandwiches and coffee. These units are operated by the Red Cross.

One of the most important Personal Equipment Facilities seen was the Class-13 Item Room. Here, by Directive from the Commanding Officer of the Group, every item in this class issued to group is turned over (on shipping ticket) to the Group Personal Equipment Officer. Assistance for operating this unit is given by men from S-4. The Personal Equipment Officer knows all items on hand, all issued, the losses from combat, ditchings, fire and other causes. Preventing shortages of critical items is one of the ways the Personal Equipment Officer can be of use to his unit. I spent some time here. Flyers came in, as into a country store, to chat, to "shop" and to indulge in the prerogative of any army man, to "bitch" about things in general and some equipment in particular. It was here that I heard some earthy comments on the A-14 oxygen mask. As I recall, it started innocently. An officer brought in a mask for exchange. He tried several masks, as one tries on one pair of shoes after another in a shoe store. Soon, it seemed, a fit was obtained. Upon leaving, Lt Carveth told him to be sure the disconnect would take a twelve pound pull. "How," I asked, "is Lt _____ to know the answer to that?"

"Simple", said Lt. Carveth, as he reached under the counter and pulled out a canvas bag loaded with twelve pounds of shot, and attached to the female part of the quick-disconnect. The mask fit was accomplished on the basis of comfort and a careful suction test alone. I could not find oxygen testing kits used at any base. Neither is the technique taught to Personal Equipment Officers in the course at Pinetree. From this point of our conversation on, I heard a general criticism of money, men and time being used for costly and perhaps untimely research while from this front line airbase, the practical problems crying for solution were those of freezing of the A-14 mask and that of inadequate clothing. Anything which failed to contribute to a solution of this question of development, supply and distribution was misdirected effort; this of course, was the attitude of the man whose job is to get the flyer to the target and back again. (And does not know of the fundamental research that has made possible the accomplishment of his job. Editor)

Outside one of the buildings, I saw a large wooden base supporting a triangular frame. There were two large concrete blocks with rings in them standing on the base. This device turned out to be a unit for testing safety harnesses. Few Personal Equipment Officers have seen one, although there is a drawing of one in TO 03-1-2. Here again, Lt. Carveth was surely discharging his duty fully with respect to 55-7!

These different units, in addition to the aircraft inspection unit (oxygen, life rafts, kits, fire extinguishers) are run in a most business-like fashion. The exigencies of the situation require preparedness for any potentiality at any time. For this reason one or two men sleep in each unit. Every one is staffed twenty-four hours a day, - without fail. This is, all in all, an exacting task. How is it administered? Over all, of course, is the Group Personal Equipment Officer. He has a number of defined duties. These are usually as follows in a heavy bomb group:

- a. Maintain a staff of trained officers and enlisted Personal Equipment Unit personnel.
- b. Operate a Class-13 item room.
- c. Obtain information concerning, and certify to, loss of Personal Equipment as a result of combat, impending ditchings or actual ditchings.
- d. Maintain records of inspection, storage, and modification of air/sea rescue equipment.
- e. Supervise issue and pick-up flak suits.
- f. Process new crew members, using combat crew equipment check list.
- g. Requisition personal and protective equipment.
- h. Operate drying and locker rooms, dinghy unit, parachute unit, and aircraft inspection suit.
1. Report to Wing or Air Division on:
 - (1) Supplies on hand and issued.
 - (2) Training hours, number attending, and number not attending.
 - (3) Data concerning interrogation on ditchings and sea searches.
 - (4) Report on aborted missions, malfunctions of Personal Equipment.
 - (5) Turn in unsatisfactory reports.

What is the relation of the Squadron Personal Equipment Officer to the Group Personal Equipment Officer? In reality, in the U. K. today (i.e., in static situation) he is an assistant Group Personal Equipment Officer. Each one exercises direct supervision of his squadron drying and locker rooms. In addition one each supervises the aircraft inspection unit, the dinghy unit, the class-13 item unit, and the parachute unit respectively. Squadron and Group Personal Equipment Officers

all share in the training of replacement of old combat crews. In mobile units, however, the Squadron Personal Equipment Officer does for his squadron all that the Group Personal Equipment Officer did with assistance.

V

After dinner, on 10 January, a feeling of something impending became very strong. I sought and secured permission to go anywhere, see anything that transpired that night and later. At 3:30 a. m. I was awakened by an orderly. It was very cold getting dressed in a Nissen Hut this particular morning with no heat. On going over to the mess at 3:45, I met Lt Carveth. Some trucks were already moving up the road loaded with officers. Other officers moved quietly, quickly into line for breakfast. Few said even a word. We had two eggs, oranges, and for the rest a G.I. breakfast. Many men did not eat much although some did eat heartily. It didn't take long to finish, to hurry into another truck and roll up the road to the line. The night was cold, clear and crisp. The place was now alive with moving men, trucks, bicycles. Truck lights were dimmed and torches flashed like fire-flies. Up the road about a mile we got out of the truck, went into a building, established our identity and took places at the rear of the long briefing room. From this point on conduct was deliberate, sure and business-like. I recommend the film, Ramrod to Emden (FR-C-409) as an absolutely authentic account of such a briefing. It conveys the stillness, the tenseness, and sureness one senses keenly at this time.

After the general briefing, naming the primary target, the approach and its characteristics, - this day was the first big U. S. raid on Brunswick, - navigators, pilots, and bombardiers went for special additional briefing. As we went to one of the squadron locker rooms, gunners were already getting their things, checking out parachutes, F-1 suits, and donning their clothes, Mae Wests, and special "charms" of various sorts. As they went off, other crew members came in and repeated the process. This continued from six until seven o'clock or a little later. By now, the roar of motors warming up was loud and seemed to come from all directions. At 0800, Fortress after Fortress taxied up the line. Precisely at the predetermined time, 0810, the Group Commanders' plane started down the run way. No sooner did it rise above the trees over the heath than the second plane followed, and so on until twenty-two were in the air, circling higher and higher. From other bases all about us, similar groups were rising, each held together by its own colored flares of the day. The ascent, forming-up and gaining altitude required considerable time, until vapor trails and the burst of distant flares from dozens and dozens of Fortresses remained for a time to cover the silence of the line.

The coordination in movement of men and machines to a fixed point at a fixed minute was perfect. Not anywhere, in the drying or locker rooms, in the 13 section, or anywhere that I could see was there a sign of confusion, of crowding, of any man looking hurriedly for his own personal equipment. This is the essence of a well-run Personal Equipment Unit, - to guarantee that every man has all that he requires at the time he needs it so that he get safely into the air, and

barring enemy action return safely to base. This is what the members of the Personal Equipment Unit did at Base _____ on 11 January 1944. There were no frost bitten men; there were no oxygen fatalities. On the return, as men came in talking excitedly, there was never any confusion as every vital piece of personal equipment was returned to its place, - inspected and ready for use once more on a moment's notice. These were the results of training, discipline, and organization which the Personal Equipment Officers of the _____ Group had achieved.

No sooner was this mission over than other duties demanded attention. While planes had to be inspected, repaired and put in order at once, routine dinghy and parachute inspection continued. In addition to this, three parachutes were dropped experimentally from 300 feet with a 150 pound dummy to prove that American parachutes will open unfailingly without elastic bands on the shrouds. More tests would be required and authority would have to be granted from above for such a deviation from requirements. But here, on the heath of Base _____ the Personal Equipment Officers were getting their own answer to the impending shortage of rubber bands:

VI

Space forbids further recounting of equally instructive experiences elsewhere. Visits were made at other bases and at the levels of Air Division Command, and Headquarters, in both the Eighth and Ninth Air Forces. In the latter organization, Personal Equipment problems differ in important respects from those in the Eighth Air Force, since the Ninth is a tactical organization. It will be on the move as invasion of the Continent proceeds. Whenever that time comes, Personal Equipment Officers will be confronted with new problems, especially with respect to the coordination of supplies. Training will not then exist as a problem. For this reason and many others the problem of training Personal Equipment Officers in this country must not become stereotyped. It must allow for the fact that the objective toward which the Personal Equipment Officer must strive is always the same - to keep the flyer flying; - to get him over the target and to assure his safe return insofar as it is humanly possible to do so.

In order to gain a broader perspective on the position which the Personal Equipment Officer occupies in U. K. operations, I was fortunate to see his role as air/sea rescue officer. I saw this as a student in the RAF School for air/sea rescue where twenty-five percent of the students are American Officers. Their work in Air Division and Group, I of course saw in my tour of duty with the Eighth and Ninth Air Forces. The other side I was privileged to witness on visits to several RAF establishments as a guest of the Air Ministry. I visited air bases, naval bases and combined headquarters. To tell of the experiences I had and of the observations I was privileged to make while there is another story.

One story will bear telling, however. It was both exciting and disappointing to be out on patrol over the North Sea and Channel; to see wave after wave of Fortresses returned overhead, and know that three, and then four Fortresses were "in the drink" somewhere nearby. Both darkness and the weather conspired against

us, so that each of three patrolling Hudsons had to return empty handed that day. Then, the next day, while visiting the Royal Navy Base at Great Yarmouth, I talked to the Captain of a launch which picked up the only crew rescued that night. Here was testimony to the fact that some Americans had not learned their lessons, and that some Personal Equipment Officers had failed in their duty. The crew of this plane, the only one saved of the four that went down, had been so unrehearsed in ditching drill that they boarded their dinghies without emergency kits of any kind. One of the Americans "happened" to have his black-out torch, a feeble signal indeed on which to rely. It just "happened" that the launch came near enough, and it just "happened" that both dinghy and launch were simultaneously on crests of the waves in a very high sea, so permitting the occupants to be seen and rescued. The stories of similar luck are too numerous to enable one to believe that all Personal Equipment Officers are doing all they can do as effectively as it must be done. But there were also accounts of perfect ditchings, of perfect use of flares, communications and good discipline in the dinghies. So evident is the good work of Personal Equipment Officers when it is good, that it seldom fails to make itself seen in a variety of ways.

To get this idea across to our student officers in this country is our primary aim. If Aviation Physiologists in widely separated parts of the world can encourage this idea also so that fliers will expect Personal Equipment Officers to aid them, the performance of our airmen will be better as a result of it.

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EDITORIAL NOTE: The foregoing article was prepared by Captain S. R. M. Reynolds at the request of The Air Surgeon in order to give Aviation Physiologists a picture of the training and duties of Personal Equipment Officers. This is desirable because the work of those officers is complementary to that of the Physiologists. The Altitude Training Program does indeed lay the foundation of physiological understanding that prepares the air crews to cooperate intelligently with the Personal Equipment Officers and to utilize the services they offer. The Aviation Physiologists can accordingly consider themselves to be essential members of the Personal Equipment Program and should cooperate in every way possible in furthering that activity. The following article by Captain Charles G. Wilber describes how one group of Aviation Physiologists has met this opportunity; Altitude Training Units assigned to various R. T. U's. have also done important work along these lines.

* * * *

SURVIVAL TRAINING IN THE ELEVENTH AIR FORCE

The majority of officers and men on flying status who are sent to this theater are inadequately prepared for emergencies arising from crashes or forced landings. It is the purpose of this article first to point out the need for proper training in survival methods for flyers operating in subarctic climates, and secondly to outline briefly the training procedure used with great success by the Aviation Physiologists in the Eleventh Air Force.

The first obstacle to be overcome in training flyers to take care of themselves in subarctic wilds is the pessimistic or fatalistic attitude of mind developed by the individual. A large number of flyers, especially officers, have decided for themselves that, should they be forced down in the subarctic, their "number is up" and they have resigned themselves to a horribly slow death or suicide. Lecturing alone will not solve the problem. Therefore, so-called "Simulated Crash Landings" have been developed in order that a flyer may prove to himself, under severe field conditions, the fallacy of his fears.

In the course of indoctrination, lectures on emergency procedures, on clothing, on Alaskan geography and biology, and demonstrations of Air Corps Arctic Emergency Kits are presented. The excellent training film "Land and Live in the Arctic" is shown, discussed, and criticized. After this, the flyers are prepared for a simulated crash landing.

The most successful of these crash landing trips have been made during the winter months when temperatures varied between 0 F. and -30 F. In groups of five to eight, the flyers are taken by truck to a previously selected training area in Chugach Mountains for a period of five days. They wear flying clothing standard for this area and have available the following: Emergency Sustenance Kits, E-1, E-2, and E-4; Arctic Emergency Kit Back Pack Style; items usually found in aircraft such as a small fire axe, wire, sheet metal, parachutes, signal flares and grenades. The flyers may take small personal articles such as pocket knives, matches, watches, etc.

The "crash" occurs on the first day. The students, always under the close supervision of the Aviation Physiologists and Altitude Chamber Technicians, select a campsite near the crashed plane and set up housekeeping, using only natural materials (spruce boughs, alder poles, etc.) and the items listed in the previous paragraph.

The first night is spent in some discomfort since most of the students are too cold to sleep for more than a few minutes at a time. This experience emphasizes the necessity of carrying their Quartermaster sleeping bags with them on all flights. On the second day, sleeping bags, previously hidden, are brought out and for the rest of the trip the students sleep well.

During the first three days the students use signal flares, grenades and improvised means for signalling. They learn how to build and maintain a fire with maximum efficiency. They are instructed how to "live off the land" and are given the opportunity of getting their own food with the rifle supplied in the E-2 kit. This latter procedure is not at all difficult in the subarctic regions where every square mile is abundantly supplied with game; moreover, the limited rations in the emergency kit furnishes ample stimulus for hunting.

For the last two days, the group is moved to a glacier about ten miles away where they are camped for the duration of the training period. Violent winds blow over the glacier regularly. On such woodless, unprotected terrain the flyers learn the value of their parachutes as tents or as wind breakers; the purpose of the gasoline stove in the E-4 kit also becomes very evident.

During the five day period the students are able to put into practice the principles, learned in the lectures, for keeping warm, avoiding freezing, and remaining healthy in subarctic wilds. The flyers are given the opportunity of shooting rabbits, grouse, ptarmigans, wolves, and other game and preparing it in the one proper method--by boiling slightly. They are encouraged to try the meat raw and frozen. Frozen fish are supplied and tasted by the students. Most of the flyers admit that after a few days on such a diet, they like it.

By means of such a procedure the flyers are made familiar with the great subarctic "outdoors". They begin to realize that a man can live in a fairly comfortable manner with a minimum of equipment at temperatures as low as 30°F. When a real crash occurs, or when they are actually forced down in the "frozen North," it will be a mere repetition of a previous pleasant experience, and not a horrible nightmare.

In a short article such as this it is impossible to give details of the training. A word concerning the training of the Aviation Physiologists and Altitude Chamber Technicians for this type of work is in order. Several months before the first Simulated Crash Landing took place the physiologists and technicians made extensive trips into the mountains and woods of the Knik Glacier area, testing the various items of emergency gear and becoming proficient in the use of them. Numerous trappers and prospectors were questioned concerning the best methods for living in the outdoors. In several instances the physiologists and technicians lived with these "sour-doughs" for a week or so in order to observe their methods of handling emergencies. On numerous trips the future instructors literally "lived off the land", eating nothing but moose or wolf, or other game obtained with weapons supplied in the emergency kits, for extended periods of time.

In the meantime, the physiologists had read all available literature, both civilian and military, concerning the Arctic life in the cold. This information was compared with what was learned from actual experiences and the whole was assembled into a course of instruction for flyers. By the time the first

"crash landing" took place the instructors were very much at home in the subarctic and were prepared to meet any emergency.

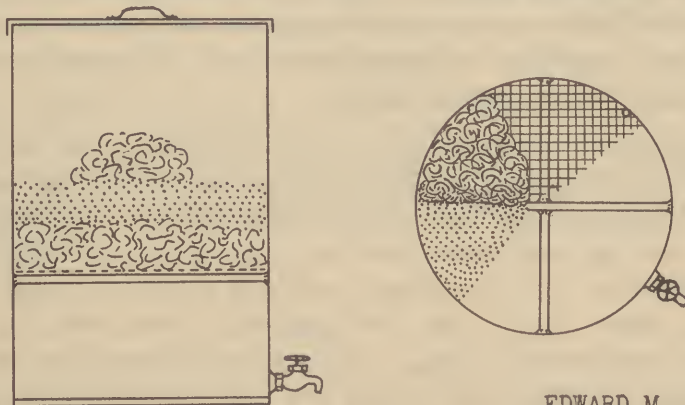
It is hoped that in the future all flying personnel assigned to duty in the subarctic areas of the world will be given suitable intensive training in the field in order to prepare them to meet whatever emergencies may arise in the course of their operational flying.

CHARLES G. WILBER
Captain, Air Corps
Alaska

* * * *

EFFICIENT FILTER

The 15th Altitude Training Unit found it expedient to salvage, by filtering, the tricesyl phosphate used as a seal in their vacuum pump. The filter is built in a fifty-five gallon drum. One head is removed and cross-bars are welded about one third of the way from the bottom. These support a piece of 1/4 inch mesh hardware cloth cut to fit snugly inside the drum, a six inch layer of steel wool, and a six inch layer of clean, white sand. A piece of steel wool thrown in on top will prevent spattering and digging up the sand when the fluid is poured in. A piece of small diameter tubing or pipe extending from the top to just below the level of the screen relieves the pressure as the fluid accumulates in the bottom. A faucet is welded in just above the bottom, and a cover prevents objects and water from entering the top. The filter has proved very efficient.



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ANOXIA REPORT FROM AN AAF PILOT SCHOOL

A student officer-pilot in four-engine transition training was involved in a high altitude anoxia accident on 20 April 1944 while flying at 30,000 feet. He was on a scheduled student routine high altitude formation flight during the afternoon flying period in a B-17 aircraft. Additional personnel aboard the plane consisted of the instructor who was also the ship commander, another student officer, an enlisted aerial engineer, and an enlisted radio operator. Approximately one hour was consumed at 8,000 ft altitude while getting in formation with other planes. After formation was complete they climbed steadily from 8,000 ft to 30,000 ft during the next two hours.

Oxygen masks were put on at 12,000 ft. No satisfactory reason was given for waiting to this altitude before using oxygen masks. The officer involved was at the controls during the take-off and constantly up to 24,000 ft except for a brief change at 12,000 ft to put on his heavy flying boots. Other than the boots his clothing consisted of a flight suit over his uniform. At 24,000 ft he was relieved of the controls by the other student, the instructor being in the co-pilot's seat. He then went to the radio room to put on his heavy fleece-lined high altitude trousers and jacket. A "walk-around" bottle of oxygen was used from the pilot's compartment to the radio room. In the radio room he plugged his oxygen mask into the main oxygen system. Up to this time he had noted no unusual symptoms except a general malaise which he considered natural effects of high altitude flying. He first put on his heavy trousers without zipping them up and then his jacket. He leaned over to zip the legs of his trousers, and realized he could not get his hands to work properly. Last thing he remembers, he is cussing his hands for not responding. He had no feeling of apprehension or desire to call for help.

The enlisted radio operator was in his usual seat and noticed the officer slump to the floor on his face, thought he had motion sickness and took no action. The radio operator confessed he had had no oxygen indoctrination and had not been through the pressure chamber.

The instructor in the co-pilot's seat turned around casually to see how the student was getting on with his clothing and noted his legs stretched across the doorway. He thought he was just sitting down but sent the aerial engineer back to investigate. The engineer noted that the officer was extremely sick and notified the instructor. The instructor made his way to the radio room to find the student lying on his face, blue, and apparently dead, with his oxygen mask tube pulled loose from the wall plug. He laid the officer flat on the floor, connected his oxygen equipment and turned him over to the aerial engineer while he took control of the plane and brought it down rapidly. The student officer regained consciousness during the rapid descent.

The instructor was the only aircrew member with a properly fitted oxygen mask. All other personnel wore masks from the stock aboard the plane. The officer concerned remembers that his mask leaked around the nose throughout the trip. Apparently when he leaned over to work the zipper on the leg of his trousers, the oxygen leak around the nose piece was sufficient to cause anoxia, and when he fell forward the plug was pulled completely loose from the wall. He estimated that he was without supplementary oxygen from 5 to 8 minutes.

He was hospitalized for two days and returned to duty. No sequelae were noted. The only subjective symptom either before or after the episode was general malaise and tiredness.

Personal equipment officer states that notice has been on the student officers' bulletin board the past six weeks stating, "Student officers will be fitted at the personal equipment office with oxygen masks." This has now been changed to read "Student officers will report immediately for oxygen mask fit to personal equipment office." Class roster is to be checked in this regard.

The above represents the only serious anoxia accident at this field in over a year and a half of flying with B-17 type aircraft.

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Captain, Medical Corps
Avn Med Examiner

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STATUS OF OXYGEN INDOCTRINATION AMONG COMBAT CREWS REACHING THE EIGHTH AIR FORCE

A report to the Surgeon, USSTAF, from Eighth Air Force composite command, states that a survey of 392 questionnaires submitted by combat crew personnel at Station 236 showed that 100 percent had received adequate instruction in the use of oxygen masks prior to arrival at the Combat Crew Replacement Center. Twenty-nine percent had not experienced the effects of anoxia; 59 percent had not received adequate instruction on the use of electrically heated flying clothing; 6 percent had not received adequate instruction concerning aircraft life rafts and life raft equipment.

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APPROVAL FOR CHAMBER FLIGHTS TO SIMULATED ALTITUDES ABOVE 40,000 FEET

Recently a number of requests have been received by the Office of the Air Surgeon for authorization of altitude chamber flights to altitudes in excess of 40,000 feet. Unless such flights are to be made in connection with research projects, it is not necessary to obtain prior approval from The Air Surgeon. The responsibility for authorizing indoctrination flights to unusually high altitudes rests with the station surgeon or senior flight surgeon who is responsible for the technical supervision of the Altitude Training Unit. Research projects to be carried out in Altitude Training Units, except those which are incidental to the operation of the program, must be approved by The Air Surgeon in accordance with paragraph 8, AAF Letter 50-28, dated 25 May 1944.